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Parasite and Catalyst:
The Polarizing Influence of Chatbots in Political Discourse

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Parasite and Catalyst:
The Polarizing Influence of Chatbots in Political Discourse

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Dedication

To those taking time to listen to opinions with which they do not agree. Also, to Daniel, my husband, who listened to all my opinions, all the time.

Abstract

Parasite and Catalyst:
The Polarizing Influence of Chatbots in Political Discourse

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Chatbots and their potential for interfering in political discourse came to the forefront of attention during the United States 2016 elections in the context of spreading disinformation and exacerbating the polarization pervading the elections, but chatbots have been used in many areas to influence political discourse. Although the chatbots are not currently able to easily pass as humans, developments in artificial intelligence, particularly Natural Language Processing may allow them to engage with people in a human-like manner in the future, enhancing their ability to exploit the rifts in society and create greater polarization in politics. To prevent this, many sectors of society need to come together to combat the potential bad effects of chatbots on political discourse.

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Introduction

Following the 2016 United States' (U.S.) presidential elections, Americans and people around the world were alarmed to learn that Russian chatbots had been at work, attempting to influence the elections by interacting with voters and spreading fake news.[1] This is not the first time, however, that chatbots have made an appearance in political communication, and many people may not realize how widespread chatbots are. Chatbots have been used to influence political discourse for years, including conversations about the civil war in Syria, the Brexit vote, and more.

In addition to their political uses, chatbots are useful in areas like retail, news curation, and healthcare. Chatbots' abilities continue to progress, and they have the potential to affect society positively, but they also bring risks to political discourse, as highlighted by the 2016 U.S. elections. By encouraging polarization, chatbots can destabilize the political landscape and weaken democratic norms.[2] While it is impossible to stop the use of chatbots in political discourse, but there are many steps that can make them less effective; finding the correct steps and implementing them requires more than technological skills, it requires society to look to the intersection of technology, culture, and institutions to find solutions.[3]

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[1] Gabe O'Connor and Avie Schneider, "How Russian Twitter Bots Pumped Out Fake News During the 2016 Election," NPR, April 3, 2017, accessed December 7, 2018 https://www.npr.org/sections/alltechconsidered/2017/04/03/522503844/how-russian-twitter-bots-pumped-out-fake-news-during-the-2016-election

[2] *See*, Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," *The German Marshall Fund of the United States*, No. 27 (2018): 4, accessed May 23, 2019, http://www.gmfus.org/publications/asd-policy-blueprint-countering-authoritarian-interference-democracies.

[3] Yochai Benkler, et., al., "Understanding Media and Information Quality in an Age of Artificial Intelligence, Automation, Algorithms, and Machine Learning," Berkman Klein Center for Internet and Society at Harvard University, July 12, 2018, accessed December 8, 2018, https://cyber.harvard.edu/story/2018-07/understanding-media-and-information-quality-age-artificial-intelligence-automation.

This paper will discuss the use of chatbots in political discourse, technological innovations that will affect chatbots, and how governments, businesses, organizations, and individuals can prepare for and respond to chatbots. This paper is divided into several sections: section one defines chatbots and gives a brief overview of what chatbots do. Section two provides a sample of the ways chatbots have been used to influence political discourse. Section three discusses methods for detecting chatbots. Section four discusses how improvements and innovations in machine learning and natural language processing will make it harder to detect chatbots and will increase chatbots' abilities to influence people. Section five will conclude with a discussion on the current strategic value of chatbots compared to their potential uses, and steps that governments, the private sector, and individuals should take to combat chatbots' negative effects on political discourse.

Section One: What are Chatbots and How Do They Work?

The term "bot" refers to computer software designed to "perform simple, repetitive, and robotic tasks"[4] automatically, i.e., without human assistance. To this chatbots add the ability to "perceive their environment and take actions that maximize their chance of success at some goal," and to use speech to communicate with humans.[5] Chatbots use artificial intelligence, especially machine learning and Natural Language Processing (NLP) to respond to human conversation.[6] NLP is a form of artificial intelligence that "teaches machines to read, analyze and interpret human language," which allows a computer to understand what a person says to it, and respond appropriately.[7] The more a person talks to a chatbot, the better the chatbot becomes at understanding and communicating with that person and other persons who engage in similar conversations with the chatbot.[8]

Consequently, humans can write computer programs, i.e. chatbots, that can post messages, tweet, and converse[9] without needing human direction. This allows the program writer

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[4] Philip N. Howard, Gillian Bolsover, Bence Kollanyi, Samantha Bradshaw, Lisa-Maria Neudert. "Junk News and Bots during the U.S. Election: What Were Michigan Voters Sharing Over Twitter?" Data Memo 2017.1. Oxford, UK: Project on Computational Propaganda, accessed December 7, 2018 https://www.oii.ox.ac.uk/blog/junk-news-and-bots-during-the-u-s-election-what-were-michigan-voters-sharing-over-twitter/.

[5] Aggeliki Androutsopoulou, E. Loukis, Nikos Karacapilidis, and Yannis Charalabidis, "Transforming the Communication Between Citizens and Government Through AI-Guided Chatbots," *Government Information Quarterly*, October 2018, accessed December 7, 2018, https://www.researchgate.net/publication/328257121_Transforming_the_communication_between_citizens_and_government_through_AI-guided_chatbots.

[6] Alison Bolen, "What are Chatbots? And How Can You Combine Them With Analytics?" *SAS Insights*, accessed May 22, 2019, https://www.sas.com/en_us/insights/articles/analytics/what-are-chatbots.html.

[7] Bolen, "What are Chatbots? And How Can You Combine Them With Analytics?"

[8] Bolen, "What are Chatbots? And How Can You Combine Them With Analytics?"

[9] Howard, Philip N., and Bence Kollanyi. 2016. "Bots, #Strongerin, and #Brexit: Computational Propaganda during the UK-EU Referendum." Working Paper 2016.1.:1, Oxford, UK: Project on Computational Propaganda. www.politicalbots.org. http://dx.doi.org/10.2139/ssrn.2798311.

to influence online conversations in a desired direction without providing intensive oversight, and multiplies the influence the programmer can have, beyond what is possible for a human.

Although chatbots can be used for a variety of purposes this paper is particularly interested in political chatbots—chatbots with political motives.[10] Political actors can use chatbots to spread information or opinions, exaggerate how many supporters an official or particular issue has, or create artificial trends.[11] This make chatbots valuable tools for governments and organizations who seek to affect political discourse and events.

[10] "Bots, #StrongerIn, and #Brexit: Computational Propaganda during the UK-EU Referendum," 1.
[11] "Bots, #StrongerIn, and #Brexit: Computational Propaganda during the UK-EU Referendum," 1, 5.

Section Two: Chatbot Usage in Political Discourse

Although it was the 2016 U.S. elections that shone the spotlight on political chatbots a for many people, chatbots have been used in the political arena for some time, by both state and non-state actors, including the U.S. government. Close examination of chatbots also shows there are five general reasons a group or individual may use chatbots in political discourse: to drown out information, to smear a person or event, to amplify a message, to antagonize different sides on an issue to create division, or to spread information or disinformation to the public. This section provides global examples of how governments, politicians, and activists have used chatbots to influence political discourse, prior to the 2016 elections, and the method they used to gain influence. The table on the next page summarizes these examples.

Country	Actor	Technology	Target	Goal	**Method**	Impact
United States	Politicians and private organizations	Twitter	Voters	Secure election success	-Smear candidates -Amplify popularity	May have affected voting, including in 2016 presidential election
Syria	The Syrian government	Twitter	Those concerned about Syrian protests	Keep information about protests out of public eye	-Drown out information by hijacking hashtags	May have decreased awareness of the situation
Russia	The Russian government	Twitter	The international community	Escape responsibility for assassinating public figure	-Smear the Ukrainians -Antagonize Ukrainians and Russians	Unlikely to have had a significant effect
Mexico	Political parties	Twitter and news intervention	Voters	Secure election success for political parties	-Amplify messages -Amplify popularity -Spread disinformation	Did not secure election success for the leading party
Venezuela	Political parties and officials	Twitter	Venezuelans	Make leaders look more important on the international field	-Amplify leaders' popularity -Spread information about events	Had little effect on political discourse
United Kingdom	Political groups and individuals	Twitter	Voters	Support arguments for/against leaving the E.U.	-Amplify opinions about Brexit -Spread information and disinformation	May have contributed to the vote to leave the E.U.

Table 1: Examples of Political Chatbots Across the Globe

In 2010, researchers at the University of Indiana discovered chatbots attempting to influence political discourse when they found a bot-driven smear campaign against the Delaware U.S. senate candidate, Chris Koons. They linked these bots back to conservative activists that

were involved with "The Freedomist" website.[12] U.S. politicians have also used chatbots to make themselves appear more popular on social networks than they actually are: for example, in the 2012 elections, Mitt Romney "was accused of buying thousands of followers on Twitter in a bid to seem more popular,"[13] and Trump had chatbot followers with Latino names tweet favorably about him to make him appear more popular with Latino voters.[14] Both politicians and political activists used chatbots in the United States to try to influence elections and popular support, and some argue they may have helped Donald Trump win the presidential election.[15]

In 2011, the Syrian government used chatbots to drown out information about crackdowns on protestors at the beginning of the Syrian civil war. The government created spam Twitter accounts that would send tweets every few minutes that targeted #Syria, which people had been following to learn what was happening with the Syrian protests. These spam accounts would post about a variety of topics, including "photography, old Syrian sports scores, links to Syrian comedy shows, pro-regime news, and threats against [those]…who expressed their support of the protests."[16] By attaching tweets that had nothing to do with the protests to this hashtag the Syrian government mixed irrelevant information into the discussion, which could have decreased awareness of the situation and affected the international response.

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[12] Philip N. Howard, S. Woolley, and R. Calo, "Algorithms, bots, and political communication in the US 2016 election: The challenge of automated political communication for election law and administration," *Journal of Information Technology and Politics* (2018), DOI: 10.1080/19331681.2018.1448735

[13] Howard, "Algorithms, bots, and political communication in the US 2016 election: The challenge of automated political communication for election law and administration," 87.

[14] Howard, "Algorithms, Bots, and Political Communication in the US 2016 Election: The Challenge of Automated Political Communication for Election Law and Administration, 81.

[15] Jeanna Smialek, "Twitter Bots Helped Trump and Brexit Win, Economic Study Says," Bloomberg, May 21, 2018, accessed December 7, 2018, https://www.bloomberg.com/news/articles/2018-05-21/twitter-bots-helped-trump-and-brexit-win-economic-study-says.

[16] Anas Qteish, "Spam Bots Flooding Twitter to Drown Info About #Syria Protests," Advox: Global Voices, April 18, 2011, accessed December 7, 2018, https://advox.globalvoices.org/2011/04/18/spam-bots-flooding-twitter-to-drown-info-about-syria-protests/.

Russia also used chatbots to interfere with political discourse before its intervention efforts in the 2016 elections. On February 27, 2015, Boris Nemtsov, a former deputy prime minister and one of Putin's top critics, was shot dead in Moscow.[17] Observers noticed that just hours after the shooting a group of Twitter accounts began posting, blaming Ukrainians for the shooting. [18] An internet researcher, Lawrence Alexander, collected a list of accounts that tweeted the phrase, "Ukrainians killed him…he was stealing one of their girlfriends," and discovered that there were 2,900 such accounts, and they were highly connected—most of them followed each other—an unusual characteristic for accounts if they are independent of each other.[19] Further, 87% of these accounts did not have time zone information, and 92% had no Twitter favorites: in a random Twitter sample, those numbers are 51% and 15%, respectively.[20] The differences between the accounts tweeting about Ukrainian involvement in the shooting and a random sample of Twitter accounts make it very likely the tweets were coming from chatbots: likely Russian chatbots who were attempting to point the finger away from Russian involvement in the murder.[21] Although this may have been the goal, the news around the shooting tended to focus on suspicions about Russian involvement, so the chatbots did not appear to have a significant impact.[22]

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[17] Vladimir kara-Murza, "The Kremlin is Blocking Scrutiny of its Investigation Into the Murder of Boris Nemtsov," August 2, 2018, accessed December 7, 2018, https://www.washingtonpost.com/news/democracy-post/wp/2018/08/02/the-kremlin-is-blocking-scrutiny-of-its-investigation-into-the-murder-of-boris-nemtsov/?utm_term=.76c2ef6e7c19.

[18] Lawrence Alexander, "Social Network Analysis Reveals Full Scale of Kremlin's Twitter Bot Campaign," Global Voices, April 2, 2015, accessed December 7, 2018, https://globalvoices.org/2015/04/02/analyzing-kremlin-twitter-bots/.

[19] "Social Network Analysis Reveals Full Scale of Kremlin's Twitter Bot Campaign."

[20] "Social Network Analysis Reveals Full Scale of Kremlin's Twitter Bot Campaign."

[21] "Social Network Analysis Reveals Full Scale of Kremlin's Twitter Bot Campaign."

[22] See, e.g., Ivan Nechepurenko, "Five Convicted in Killing of Boris Nemtsov, Russian Opposition Leader," NYT, June 29, 2017, accessed December 7, 2018, https://www.nytimes.com/2017/06/29/world/europe/boris-nemtsov-russia.html.

The Mexican government and Mexican political parties also used chatbots in elections and to spread disinformation. For example, in the 2012 presidential elections, the Institutional Revolutionary Party (PRI) used tens of thousands of chatbots to amplify their message by automatically tweeting and retweeting certain messages, in the hopes of becoming one of Twitter's trending topics.[23] Chatbots also came into play in a 2017 governorship race for the central state of Mexico: in the election, the PRI used chatbots to spread messages against its main rival candidate, Delfina Gomez.[24] Researchers also found that chatbots were deployed in the 2018 election: all parties used them, although the PRI has been the focus of reporting.[25] Chatbots also inserted fake news into the media, for example, researchers found a March 2018 claim that an opinion poll commissioned by the New York Times, showed Meade (the PRI candidate) in the lead.[26] The poll, however, was fictional, as Mead appeared in third place in most polls.[27] The widespread use of chatbots in Mexico shows the many ways actors can use them to attempt to influence political discourse; the outcomes of the recent elections, however, show they may not be particularly good at influencing political discourse. The PRI used chatbots more than perhaps any other party in the 2018 elections, but they suffered a "record defeat" on election day, when the PRI presidential candidate won only 16% of the vote, putting him in third place, and the party lost all of the governorship races.[28]

[23] Mike Orcutt, "Twitter Mischief Plagues Mexico's Election," MIT Technology Review, June 21, 2012, accessed December 7, 2018, https://www.technologyreview.com/s/428286/twitter-mischief-plagues-mexicos-election/.
[24] Marcos Martinez, "Mexico Election: Concern About Election Bots, Trolls, and Fakes," BBC, May 30, 2018, accessed December 7, 2018, https://www.bbc.com/news/blogs-trending-44252995.
[25] "Mexico Election: Concern About Election Bots, Trolls, and Fakes."
[26] Mexico Election: Concern About Election Bots, Trolls, and Fakes."
[27] "Mexico Election: Concern About Election Bots, Trolls, and Fakes."
[28] Dave Graham, "RIP PRI? Mexico's Ruling Party in 'Intensive Care' After Drubbing," Reuters, July 4, 2018, accessed December 7, 2018, https://www.reuters.com/article/us-mexico-election-pri/rip-pri-mexicos-ruling-party-in-intensive-care-after-drubbing-idUSKBN1JU1H1.

Researchers also examined chatbots and political discourse in Venezuela. In one study, researchers found that during 2015 politicians and activists used chatbots for "impression management" by "spreading news about how leaders perform in public events within Venezuela and…building the reputation that leaders are international statesmen in conversation with the leadership of other countries."[29] Overall, they found the effect of chatbots to be subtle, with less than 10% of retweets coming from chatbots, and most retweets promoting harmless political events, rather than attacking people or spreading disinformation.[30] Here, politicians used chatbots to influence political discourse but their impact was small, and the harmful effects that manifest in other instances are not apparent, although the researchers posited chatbots usage may have been different if they had studied their use during a political crisis.[31]

The Brexit vote is another example of chatbot activity that garnered significant attention because of concerns about disinformation and chatbots' role in the conversation about whether to leave or stay in the European Union (E.U.). Researchers with the Computational Propaganda Project at Oxford looked at Twitter activity during the Brexit vote to find how much social media content was related to positions on the Brexit debate, and how much of that conversation was driven by chatbots.[32] They found that of the ten Twitter accounts that generated the most volume on the issue, seven of the ten were almost certainly chatbots.[33] These top users did not create new content, but instead retweeted others' content—they amplified opinions and trends.[34] Further, they found the chatbots were mainly associated with hashtags related to the argument for leaving the E.U., although the two most active accounts for each side of the debate were both

[29] Michelle Forelle, et., al., "Political Bots and the Manipulation of Public Opinion in Venezuela," July 25, 2015, http://dx.doi.org/10.2139/ssrn.2635800, 5.
[30] "Political Bots and the Manipulation of Public Opinion in Venezuela," 6.
[31] "Political Bots and the Manipulation of Public Opinion in Venezuela," 3.
[32] "Bots, #StrongerIn, and #Brexit: Computational Propaganda During the UK-EU Referendum," 1.
[33] "Bots, #StrongerIn, and #Brexit: Computational Propaganda During the UK-EU Referendum," 4.
[34] "Bots, #StrongerIn, and #Brexit: Computational Propaganda During the UK-EU Referendum," 4.

chatbots, neither of which generated new content, but instead retweeted content from their respective sides.[35] Recent research suggests that chatbots may have influenced the vote to leave the E.U., although that may be attributable to Russian, rather than British chatbots, which are not discussed in this particular example.[36] Russian influence aside, researchers are still concerned about the effect of chatbots and political discourse because of chatbots' ability to spread misinformation automatically across social media, and users' increasing struggle to separate bots from humans on social media.[37]

These examples showcase just a few of the times, places, and reasons actors have used chatbots: a study by the Computational Propaganda Project reviewed organized social media manipulation throughout the world and found that of the 46 countries they sampled 38 had fake accounts that were automated to disperse political messages, and these messages were usually either pro-government, or attacks on the opposition.[38] The countries that had these fake automated accounts ranged from Angola to China to Ecuador to South Africa and many more in between.[39] Chatbots are widespread, and will likely spread more widely in the future.

The preceding examples focus on Twitter chatbots, who act mainly by liking and retweeting content rather than creating new content and engaging in conversation with other users. There are also chatbots that can have conversations, however, and they have begun to influence the political sphere. The 2016 U.S. elections saw the rise of chatbots involved in the

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[35] "Bots, #StrongerIn, and #Brexit: Computational Propaganda During the UK-EU Referendum," 2, 5.
[36] Jeanna Smialek, "Twitter Bots Helped Trump and Brexit Win, Economic Study Says," Bloomberg, May 21, 2018, accessed December 7, 2018, https://www.bloomberg.com/news/articles/2018-05-21/twitter-bots-helped-trump-and-brexit-win-economic-study-says.
[37] "Bots, #StrongerIn, and #Brexit: Computational Propaganda During the UK-EU Referendum," 5.
[38] Samantha Bradshaw and Philip N. Howard, "Challenging Truth and Trust: A Global Inventory of Organized Social Media Manipulation," Working Paper 2018.1. Oxford, UK: Project on Computational Propaganda, 12, http://comprop.oii.ox.ac.uk/wp-content/uploads/sites/93/2018/07/ct2018.pdf.
[39] Samantha Bradshaw and Philip N. Howard, "Challenging Truth and Trust: A Global Inventory of Organized Social Media Manipulation," Working Paper 2018.1. Oxford, UK: Project on Computational Propaganda, 14, http://comprop.oii.ox.ac.uk/wp-content/uploads/sites/93/2018/07/ct2018.pdf.

election process. The HelloVote chatbot, a Facebook and text-based chatbot helped people register to vote: it greeted users, saying "'I can get you registered to vote with just a few messages,'" and would use information provided by the users to help them register.[40] Then, as election day drew closer, the chatbot would send individuals details on where and how to vote.[41] Another, Facebook-based chatbot, HillYEAH!, offered individuals, among other things, pro-Clinton messages to post on social media and reminded them of state voting deadlines.[42] None of these conversational chatbots are particularly threatening to political discourse—many of them are even designed to improve participation in the political process. The problem is that the technology used to create these chatbots has the potential to prey on weaknesses in the communication architecture and obstruct fair political processes. Fortunately, technology also has the potential to help track down chatbots and prevent them from impacting political discourse.

[40] Nancy Scola, "How Chatbots are Colonizing Politics," Politico, October 11, 2016, accessed December 8, 2018, https://www.politico.com/story/2016/10/chatbots-are-invading-politics-229598.
[41] Nancy Scola, "How Chatbots are Colonizing Politics," Politico, October 11, 2016, accessed December 8, 2018, https://www.politico.com/story/2016/10/chatbots-are-invading-politics-229598.
[42] Nancy Scola, "How Chatbots are Colonizing Politics," Politico, October 11, 2016, accessed December 8, 2018, https://www.politico.com/story/2016/10/chatbots-are-invading-politics-229598.

Section Three: Detection

Although chatbots have the potential to disrupt political communication, it is often easy to know if a user on social media, particularly Twitter, is a chatbot. Some harmless chatbots are not concerned about trying to appear human, but others, like those intended to make a person look more popular than they are, or who amplify messages by liking and retweeting content, would like Twitter users to believe they are humans who support a person or position. Chatbots, however, tend to lack certain human characteristics that can help distinguish them from human users, and artificial intelligence itself, which enables chatbots, may be used to separate chatbots from humans online.

Chatbot profiles often lack basic Twitter profile information, like profile pictures and screen names: the lack of a profile picture is such a well-known characteristic that these types of accounts have gained the nickname "Twitter eggs," because Twitter's default profile picture is an egg.[43] Additionally, when Lawrence Alexander analyzed the chatbots involved in the Boris Nemtsov example he found that out of the 2,900 users he analyzed, 87% of the profiles did not have time zone information, and 92% did not have any Twitter favorites, which was very different compared to a random sample of Twitter users: only 51% did not have time zone information, and only 15% did not have any Twitter favorites.[44] This provides four characteristics to help discern if a Twitter user is a chatbot: screen names, profile pictures, time zone, and favorites. Checking to see if a profile contains this information, can help users determine whether a particular action comes from a human or a chatbot.

[43] Howard, "Algorithms, Bots, and Political Communication in the US 2016 Election: The Challenge of Automated Political Communication for Election Law and Administration, 83.
[44]Lawrence, "Social Network Analysis Reveals Full Scale of Kremlin's Twitter Bot Campaign."

Not all chatbot efforts at influencing political discourse on Twitter can be revealed by one person looking at one profile at a time. For instance, when chatbots like and retweet content to land a topic on Twitter's list of trending topics individuals looking at the list of trending topics cannot tell if they are there because of the work of chatbots or not. In situations like this, machine learning, a subset of artificial intelligence, can be helpful. Machine learning has helped stop spam email for decades by "analyzing messages' text and determining how likely it is that a particular message is a real communication from an actual person—or a mass-distributed solicitation for pharmaceuticals or claims of a long-lost fortune."[45] Social media platforms, governments, and other organizations could use this same technology to analyze the content of account profiles to determine if they are chatbots and flag or remove them. They could also analyze the accounts tweeting about topics and provide information about the likely percentage of chatbots involved in the conversation.

Chatbots that are designed to engage in a conversation with human users are often easy to detect in an extended conversation because they struggle to respond to human questions and comments in a similarly human way, meaning humans realize they are not talking to a real person. The Loebner prize is awarded every year to the creator of the most human-like chatbot, and the judging is done via a Turing test where judges converse via computer with both a human and a chatbot about certain topics and then try to guess which is the human and which is the chatbot.[46] The 2017 competition provides insight into the problems chatbots still face in responding to questions and comments in a way that convinces the other participant that the bot

[45] "How Artificial Intelligence Can Detect—and Create—Fake News," The Conversation, May 3, 2018, accessed December 8, 2018, http://theconversation.com/how-artificial-intelligence-can-detect-and-create-fake-news-95404.
[46] Charlie Moloney, "How to Win A Turing Test (The Loebner Prize)," Chatbots Magazine, September 24, 2017, accessed December 8, 2018, https://chatbotsmagazine.com/how-to-win-a-turing-test-the-loebner-prize-3ac2752250f1.

is a human.[47] All of the chatbots, even the one that ultimately won the prize, made mistakes, like providing dictionary definitions to questions or providing odd answers when asked to describe YouTube, that would have alerted a regular user that the other participant was a chatbot.[48]

Although chatbots have these weaknesses, as technology continues to progress, machine learning and natural language processing may resolve these weaknesses and make it more difficult to determine when chatbots are at work.

[47] Charlie Moloney, "How to Win A Turing Test (The Loebner Prize)," Chatbots Magazine, September 24, 2017, accessed December 8, 2018, https://chatbotsmagazine.com/how-to-win-a-turing-test-the-loebner-prize-3ac2752250f1.
[48] Moloney, "How to Win A Turing Test (The Loebner Prize)."

Section Four: The Future of Bots

Machine learning and natural language processing are two technologies that have the potential to significantly increase chatbots' uses. going from simply retweeting and liking content and engaging in simple conversations using canned responses, to creating content and having conversations that are convincingly human-like. Machine learning is a subset of artificial intelligence, and "[m]achine [l]earning at its most basic is the practice of using algorithms to parse data, learn from it, and then make a determination or prediction about something in the world."[49] A chatbot that uses machine learning can take information it gets about the popularity of its (or others') posts, tweets, retweets, etc., and other responses to its activities, and use that information to continually update its actions to ensure its content has as much impact as possible.

Natural language processing is when a computer "organiz[es] and understand[s] language in a human way,"[50] it allows computers to both understand information and communicate using language humans understand. A chatbot with extensive natural language processing skills will be able to understand conversations and content and respond to them using language a human user would use. Combined, these machine learning and natural language processing capabilities can create chatbots that can masquerade as humans and engage in political conversations, while using their computing power to learn how best to spread their message based on responses to other messages they or other actors deliver.

Although chatbots like these are still in the future, the technology is developing that will make them a reality. Once that is the case, those who are interested in affecting political discourse can create chatbots to function on Twitter, Facebook, or other areas online and use the

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[49] Michael Copeland, "What's the Difference Between Artificial Intelligence, Machine Learning, and Deep Learning?" Nvidia, July 29, 2016, accessed December 8, 2018, https://blogs.nvidia.com/blog/2016/07/29/whats-difference-artificial-intelligence-machine-learning-deep-learning-ai.

[50] William D. Eggers, David Schatsky, and Peter Viechnicki, "AI Augmented Government: Using Cognitive Technologies to Redesign Public Sector Work," Deloitte Insights, 6, April 26, 2017, accessed December 8, 2018,

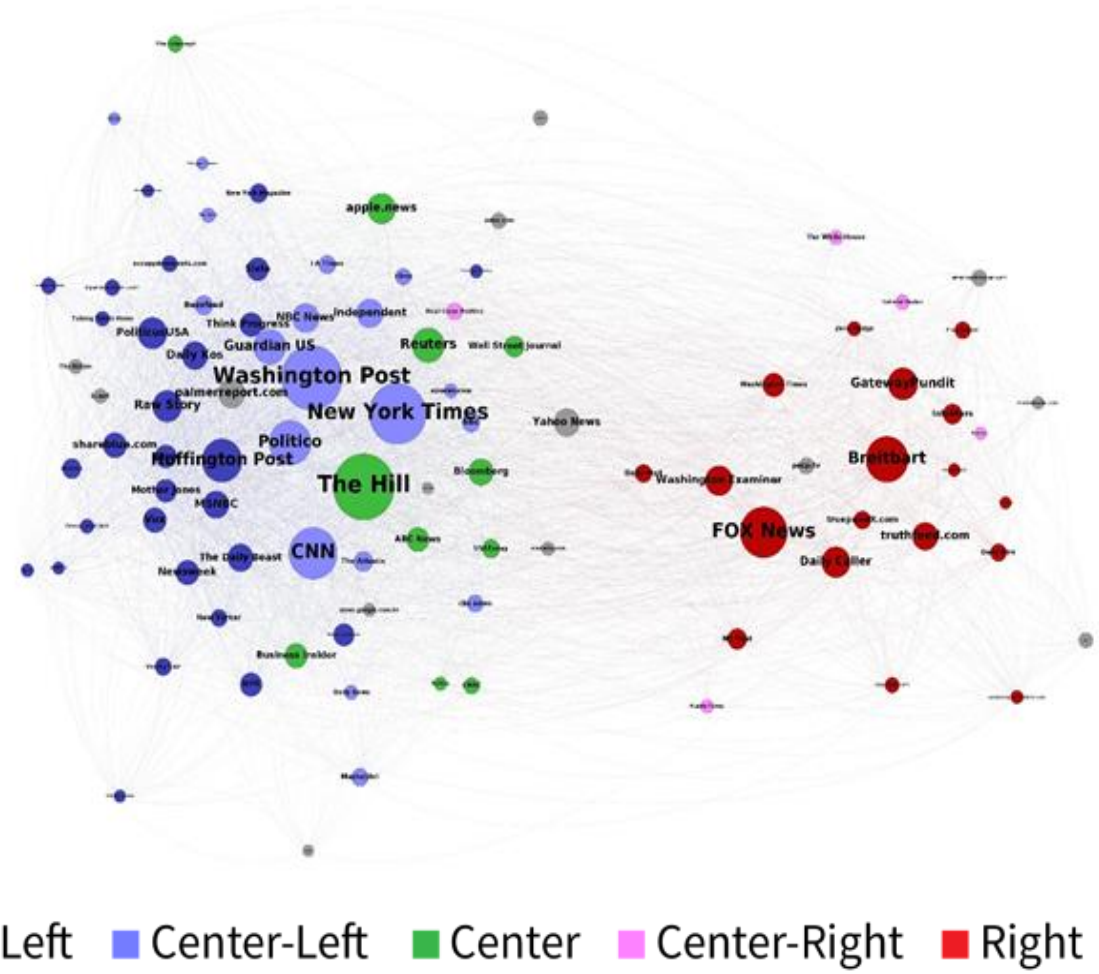
chatbots to target people and conversations to influence their opinions and actions: "they might seek out susceptible users and approach them over private chat channels. They'll eloquently navigate conversations and analyze a user's data to deliver customized propaganda."[51] Humans will not recognize they are conversing with a chatbot that is trying to manipulate them but will believe they are engaged in legitimate conversations with another person. The solution to the problems chatbots pose will require technical, institutional, and cultural efforts.[52]

[51] Future Elections May be Swayed by Intelligent Weaponized Chatbots.
[52] Benkler, et., al., "Understanding Media and Information Quality in an Age of Artificial Intelligence, Automation, Algorithms, and Machine Learning."

Section Five: Polarization, Chatbots, and Choice

During the 2016 elections misinformation and fake news were serious problems as false stories, particularly about Hillary Clinton, gained significant popularity.[53] A study by Harvard's Berkman Klein Center for Internet and Society "mapped out media source networks in open web media (online news, blogs, etc.) and on Twitter to learn how media sources clustered together based on similar cross-media linking and sharing patterns"[54] and found a serious rift between the right and the rest of the political media spectrum. They found that media like the Wall Street Journal, which leans center right, all the way to far left media sources, like Mother Jones, "comprise[d] a single interconnected media ecosystem."[55] But there was a significant gap between these media sources and those on the right, meaning there is little crossover between the news media those on the right consume and the news media those in the center and to the left consume.[56]

[53] See, e.g., Craig Timberg, "Russian Propaganda Effort Helped Spread 'Fake News' During Election, Experts Say," The Washington Post, November 24, 2016, accessed December 8, 2018, https://www.washingtonpost.com/business/economy/russian-propaganda-effort-helped-spread-fake-news-during-election-experts-say/2016/11/24/793903b6-8a40-4ca9-b712-716af66098fe_story.html?utm_term=.ddddd7132353.
[54] Benkler, et., al., "Understanding Media and Information Quality in an Age of Artificial Intelligence, Automation, Algorithms, and Machine Learning."
[55] Benkler, et., al., "Understanding Media and Information Quality in an Age of Artificial Intelligence, Automation, Algorithms, and Machine Learning."
[56] Benkler, et., al., "Understanding Media and Information Quality in an Age of Artificial Intelligence, Automation, Algorithms, and Machine Learning."



Network map based on Twitter media sharing from January 22, 2017, to January 21, 2018. Nodes are sized by number of Twitter shares.[57]

Illustration 1: Network Map Showing Media Interconnectedness

Fake news and polarization are two areas where chatbots have an important impact. People interested in influencing political discourse can use chatbots to amplify fake news across social media by sharing, liking, and retweeting. This contributes to polarization by spreading fake news stories within groups that do not generally interact with other media news sources that could disprove the false stories.

[57] Benkler, et., al., "Understanding Media and Information Quality in an Age of Artificial Intelligence, Automation, Algorithms, and Machine Learning."

Despite the expansive use of chatbots, the burgeoning interest in their ability to affect communication, and their increasing technological ability, chatbots are not currently in a position to seriously impact political discourse: the study by the Berkman Klein Center determined that chatbots were background noise in the 2016 elections, rather than a method of strategic interference.[58] The researchers wrote that after conducting their analyses about communication during the election period, they removed accounts they identified as bots and reran their analyses, but found the "communication architecture…remain[ed] unchanged."[59] Instead of chatbots, it is the "interaction of technology, institutions, and culture" that are behind the erosion of political communication.[60] As technology advances chatbots are likely to become a more strategic asset for politically motivated actors, and are therefore a cause for concern, but an adequate response to chatbots requires taking into consideration the many reasons behind chatbots' ability to influence political discourse. Real solutions will require cultural, institutional, and technological efforts to protect political discourse in the future, and NATO, the EU, the federal government, state governments, the private sector, media, and civil society must all be involved.[61]

NATO AND THE EU

Because of the international nature of Russia's efforts to interfere in political discourse and weaken democracies, international institutions should become involved in preventing further activities. One way to do this is to create a Joint NATO-EU Task Force on Countering

[58]Benkler, et., al., "Understanding Media and Information Quality in an Age of Artificial Intelligence, Automation, Algorithms, and Machine Learning."
[59] Benkler, et., al., "Understanding Media and Information Quality in an Age of Artificial Intelligence, Automation, Algorithms, and Machine Learning."
[60] Benkler, et., al., "Understanding Media and Information Quality in an Age of Artificial Intelligence, Automation, Algorithms, and Machine Learning."
[61] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," *The German Marshall Fund of the United States*, No. 27 (2018), accessed May 23, 2019, http://www.gmfus.org/publications/asd-policy-blueprint-countering-authoritarian-interference-democracies.

Asymmetric Threats,[62] to enhance cooperation between the two on "hybrid and cyber threats."[63] Currently, both organizations monitor Russian efforts, but they are neither coordinated nor well-funded.[64] The Joint Task Force could jointly analyze threats and ensure that both organizations share threat information and technical expertise, and monitor disinformation campaigns and coordinate responses.[65] NATO and the EU should also provide more funding to NGOs who "monitor and expose disinformation campaigns,"[66] thereby providing another line of defense against foreign interference.

U.S. Federal Government

There are many ways the U.S. Federal Government can and should help prevent further chatbot and other types of cyber interference in domestic political discourse. It is critical that the government present a "united front" and "transcend the politicization of civic discourse" to declare to U.S. citizens and the world that it recognizes the threat these activities pose to democracy, and it is determined to punish these activities.[67] To punish these activities, the federal government should strike at one of Russia's weakest spots: the ruling regime's desperate need to survive.[68] This survival depends on "corrupt financial links that tie together the political leadership, security services, and business," and the U.S. can exploit this weakness by "using

[62] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 29.
[63] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 29.
[64] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 29.
[65] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 29-30.
[66] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 31.
[67] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 17.
[68] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 18.

sanctions, asset forfeiture, and anti-money laundering tools" to hurt the financial base of the Kremlin.[69]

The President should also consider establishing a Hybrid Threat Center at the Office of the Director of National Intelligence (ODNI), which, among other things, could monitor social media to track and analyze disinformation campaigns as well as technological trends and changes to prepare to respond to improvements in methods for spreading disinformation, like chatbots.[70] It would also be wise for Congress to pass legislation that requires bots to be identified and labelled, so consumers know who and what they are interacting with.[71]

The government should also help build societal awareness of and resistance to foreign interference in political discourse through means like chatbots.[72] This could include endorsing "groups that promote civics education and media literacy programs," and working with state governments to establish "statewide civics and media literacy programs."[73] Hopefully, this will help minimize the societal divisions Russia has recently targeted to try to weaken U.S. democracy and impede Russia's efforts to further exacerbate these rifts, while teaching Americans to be more aware of their consumption of online information and the ways their interactions might be manipulated.[74] In conjunction with this work, the Department of Homeland Security or the White House, could launch a Public Service Announcement campaign to teach

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[69] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 18.
[70] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 25-26.
[71] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 27.
[72] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 28.
[73] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 28.
[74] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 28.

"smart cyber behavior" and increase awareness about foreign interference and its effects on "U.S. citizens, businesses, and institutions."[75]

During the summer of 2018, the Senate Select Committee on Intelligence held hearings on foreign influence on social media where they heard from a variety of experts on the events that took place leading up to the 2016 elections, and they took social media platforms to task for not doing more to stop the spread of disinformation.[76] This type of review is important, as is the pressure on social media companies: the government should investigate the extent and influence of chatbots and encourage companies to guard more carefully against chatbots. Leaning on social media platforms should not be the only response from the government: there is much to be gained from working with universities and organizations in the response to chatbots. In particular, the government can use the traditional method for encouraging research: grants to universities to encourage computer scientists to research chatbot detection and to encourage legal and policy experts to research chatbot effects and possible institutional and cultural solutions

PRIVATE SECTOR

Changes in technology make chatbots possible, and they can, at the same time, protect against nefarious chatbot activity. Companies or concerned individuals could create programs to monitor Twitter or Facebook accounts, checking for characteristics that suggest the accounts are chatbots: time zone information, lack of favorites or profile pictures, etc. These accounts could then be removed, or placed on a watch list, depending on the abilities and desires of the program creator. The same principle could be applied to trending Twitter topics or other viral online

[75] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 28.
[76] Ben Popken, "Senate Intel Committee Grapples With Social Media 's Threat to Democracy," NBC News, August 1, 2018, accessed December 8, 2018, https://www.nbcnews.com/tech/tech-news/senate-intel-committee-grapples-social-media-s-threat-democracy-n896741.

content: individuals or companies could create programs to evaluate the users that are posting to the topic or sharing other content to determine what percentage of the conversation is driven by chatbots. This technology, however, requires institutions and individuals to care enough to develop and apply it. Given the concern about chatbots improperly influencing politics, it would be valuable for researchers to also examine how to spot chatbots even as they become more sophisticated.

Until recently, Facebook and Twitter, social media platforms where chatbots are particularly common, have been reluctant to implement measures to control and reduce chatbots. Recent events, and the public outcry they provoked, however, have led both platforms to take actions that may curb the influence of chatbots. Twitter has historically been resistant to censoring speech on its platform, but with the rise of ISIS and the global outcry its violence has provoked, Twitter began removing accounts that belonged to ISIS or ISIS operatives, which may have included ISIS chatbots.[77] After the 2016 U.S. presidential elections and fears about chatbot influence, Twitter also announced changes that would limit "services that allow links and content to be shared across multiple accounts," in other words, the software that enables chat bots.[78] Facebook also took steps after the 2016 elections that will likely reduce chatbot influence: after news broke that Russians spread fake news on Facebook in an effort to sway the elections results, Facebook announced that it would be conducting more rigorous fact checking and hiring more security personnel.[79] Although these steps were specifically designed to combat fake news, they may also impact the number of chatbots, since chatbots were a means for spreading fake

[77] See Jessica Stern and J.M. Berger, *ISIS: The State of Terror* (New York: HarperCollins, 2015), and https://www.theguardian.com/technology/2016/feb/05/twitter-deletes-isis-accounts-terrorism-online

[78] Jon Russell, "Twitter is (Finally) Cracking Down on Bots," Tech Crunch, February 2018, accessed December 8, 2018, https://techcrunch.com/2018/02/22/twitter-is-finally-cracking-down-on-bots/.

[79] Sam Levin, "Facebook Offers Plan to Tackle Fake News Ahead of U.S. Midterms," The Guardian, March 29, 2018, accessed December 8, 2018, https://www.theguardian.com/technology/2018/mar/29/facebook-fake-news-political-ad-security-us-midterms-2018.

news. Twitter and Facebook's response to ISIS and fake news demonstrates there may be a certain level of public outcry necessary before the companies respond, and the outcry over ISIS and the 2016 elections reached the requisite level. Relatedly, it appears there was a financial incentive for the companies to respond, as the stock value of both companies declined in 2018, a decline that is linked to election blowback.[80] Now that chatbots are in the public eye, hopefully social media platforms will continue their efforts to curb the influence of malevolent political chatbots.

There are several steps social media platforms should take in the future to curb the influence of chatbots. They should create clear rules for verifying users and content, and for when to remove content and accounts that violate the platforms Terms of Service.[81] Platforms should continue to work on AI tools that can identify chatbots that are manipulating social media,[82] which, combined with greater efforts to remove accounts that violate the platform's Terms of Service, will help stem the growth of malicious chatbot activity. Beyond what each company does individually to combat manipulative chatbots, social media and news platforms should create means to collaborate on the effort to stop chatbots from spreading disinformation and manipulating public opinion.[83] This is particularly important because disinformation

[80] Elizabeth Dwoskin and Craig Timberg, "'Too Easy to Manipulate: Russian Disinformation Finally Costs Facebook and Twitter," The Washington Post, July 31, 2018, accessed December 8, 2018, https://www.washingtonpost.com/technology/2018/07/31/too-easy-manipulate-russian-disinformation-finally-costs-facebook-twitter/?utm_term=.a832a09a3a20.

[81] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 32.

[82] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 33.

[8383] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 31.

campaigns are not usually limited to one platform, but work across multiple platforms to exacerbate societal divisions.[84]

The new interest in the effects of chatbots on political discourse may also spur more research on technological methods to detect chatbots. Universities and think tanks should devote resources to studying how to identify and respond to chatbots, especially as technology makes it increasingly difficult to separate chatbots from humans. For example, some universities, including the University of Texas at Austin are starting cross-disciplinary programs to train individuals on the legal, technical, and policy issues involved in cyber security, including issues like chatbots. This type of education is important because it makes it easier to come up with solutions that take into consideration the difficulties chatbots present in technical, legal, and social areas. Private companies also have an important role to play in these programs as they can provide an important source of funding; for example, in 2014 the Hewlett Foundation provided $45 million to three universities to fund new cybersecurity policy initiatives.[85] Philanthropies, and companies with philanthropy branches should continue to support organizations that are working to identify manipulative chatbots and stop the spread of disinformation.[86]

MEDIA ORGANIZATIONS

Media organizations also have a role to play in chatbots influence on political discourse. Chatbots can spread disinformation across social media platforms and create artificial news trends. This information and these trends may eventually be used by or reported on by traditional

[84] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 31.
[85] "Hewlett Foundation Funds New MIT Initiative on Cyber Security Policy," MIT news, November 18, 2014, accessed December 8, 2018, http://news.mit.edu/2014/hewlett-foundation-funds-mit-initiative-cybersecurity-policy-1118.
[86] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 33.

news sources, giving further authority to false or manipulative narratives.[87] To help prevent this, news organizations can implement "guidelines for using social media accounts as sources in stories."[88] These guidelines should include verifying social media accounts before publishing information from them by ensuring the account is verified by the social media platform, and by contacting the user on the phone.[89] News media should also be more responsible in citing social media posts by quoting, rather than embedding them.[90] This removes information about "replies, retweets, and favorites, which might provide an "inaccurate snapshot of an account's popularity or legitimization of the information due to the account's alleged popularity,"[91] popularity that can be faked using chatbots.

CIVIL SOCIETY AND INDIVIDUALS

Civil society and individuals also have a duty to help prevent chatbots and disinformation from manipulating political discourse Individuals need to change how they consume and respond to news. A chatbot cannot force a person to do or think something, no matter how sophisticated, instead, chatbots exploit division within society and between people.[92]

[87] *See,* Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 34.
[88] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 34.
[89]Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 34.
[90] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 34.
[91] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 34.
[92]"Exhibit," U.S. Senate Select Committee on Intelligence, accessed December 8, 2018, https://www.intelligence.senate.gov/sites/default/files/documents/exhibits-080118.pdf.

These two pictures were created by the Russian government and distributed over Facebook. The picture of the veteran had 723, 750 engagements on Facebook, and the Yosemite Sam picture was the most shared post on Facebook, with 986, 203 engagements. Both are an example of some of the information chatbots might spread, and both exploit pre- existing rifts within U.S. society.

Illustration 2: Popular Memes Distributed by the Russian Government[93]

As technology advances and allows chatbots to become more dangerous, it can also help identify and stop nefarious chatbots, but it cannot be the only line of defense. Individuals need to take ownership of their experience and interactions online. This should include working to prevent polarization and filter bubbles by proactively reading from different news sources on both the right and left, rather than reading the individualized articles social media platforms offer users. It would be useful for individuals that are on social media to have a basic knowledge of common characteristics of chatbots and fake news: with the rise of online classes and education, it would be easy to complete a class on social media and news integrity. It should also mean simply being aware of the possibility of chatbots' effort to impact political discourse, and not being swept along by a trend or story without personally investigating either. Chatbots have the potential to change political discourse, whether that change is good or bad depends not only on technology, but how individual members of society respond to the events and discourse around them.

[93] "Exhibit," U.S. Senate Select Committee on Intelligence, accessed December 8, 2018, https://www.intelligence.senate.gov/sites/default/files/documents/exhibits-080118.pdf.

Individuals should also "pressure elected officials to take this threat seriously and address it immediately."[94] Individual citizens should also come together to create advocacy groups that raise awareness about the issues of chatbots and disinformation and put pressure on officials.[95]

Chatbots are a world-wide phenomenon, and political actors have used them for a variety of purposes. Fortunately, chatbots cannot yet masquerade well as humans in extended conversations, but as technology advances it will provide chatbots with more abilities and increase their potential to interfere with political discourse. It is tempting to lay the blame for chatbots' interference purely at the feet of technology, but chatbots exploit previously existing divisions and weaknesses in society, which means the problem, and the solution, are not simply technical. The solution to the problem of nefarious chatbots lies at the intersection of culture, technology, and institutions,[96] and it is key for actors in each of these areas to find ways to help stem the advance of bad-intentioned chatbots—if they do, chatbots may be a help to society, otherwise, they have the potential to seriously degrade politics and civil society around the world.

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[94] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 37.

[95] Jamie Fly, Laura Rosenberger, and David Salvo, "Policy Blueprint for Countering Authoritarian Interference in Democracies," 37.

[96] Yochai Benkler, et., al., "Understanding Media and Information Quality in an Age of Artificial Intelligence, Automation, Algorithms, and Machine Learning," Berkman Klein Center for Internet and Society at Harvard University, July 12, 2018, accessed December 8, 2018, https://cyber.harvard.edu/story/2018-07/understanding-media-and-information-quality-age-artificial-intelligence-automation.

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